THE LORICATES OF THE NEOZELANIC REGION.

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Since part II. of this paper appeared (this journal, pp. 75-95) we have seen the Loricates collected by Dr. H. K. Finlay, of Dunedin, including a number dealt with by Edwin Ashby in a paper published shortly after our paper. Amongst these a new species and a new record belonging to the family Lepidopleuridae were introduced.

Add to II. Family Lepidopleuridae.

12a. Terenochiton finlayi.

(Plate xvi., figs. 2-5.)

1929. *Lepidopleurus finlayi* Ashby, Trans. N.Z. Inst., lx., 372, pl. 32, figs. 5, 6, 7, August 29. 60 fath., Otago Heads, N.Z. Type in Australian Museum (ex Finlay collection).

The essential features of this distinct Lepidopleurid can well be seen in the figures here given, the many-rayed anterior valve contrasting with the distantly placed lirae of the pleural area.

Shell small, elongate oval, elevated, semi-keeled, side slopes somewhat curved, girdle scaly.

Colour pale buff to brown.

Sculpture of granules: The anterior valve very closely rayed with rounded pustules, about fifty rays being counted; the pleural area has about twelve rows of large pustules, less and crowded at the jugum, widely spaced and much larger towards the girdle; lateral area closely rayed as the anterior valve and showing marked growth periods, four or five being notable.

The mucro is ante-median, the posterior slope somewhat steep and a little concave.

Girdle scales minute, elongate, rather erect.

Dimensions: Length, 4 mm.; breadth, 2.75 mm. (Holotype: Ashby).

Habitat: Dredged in 60 fathoms off Otago Heads, N.Z.

Remarks: Ashby has written about some strange bunches of spicules observed on the type which he dissected, *but these were not present on the second example*, so apparently were of no import.

13a. Parachiton subantarcticus *sp. nov.*

(Plate xvi., figs. 6-7.)

1929. *Lepidopleurus columnarius* Ashby, Trans. N.Z. Inst., lx., 372, pl. 32, fig. 9, August 29. 95 fath., off Auckland Island.

Ashby has added this Tasmanian species to the New Zealand List on the strength of a single valve. We would have ignored the valve, but inasmuch as it has been introduced it must be dealt with. The valve in question is before us as we write. It is quite distinct from the Tasmanian species, with the type of which we have compared it, notwithstanding Ashby's association. Ashby's photograph does not correctly show the form of the valve which is well rounded with scarcely the suggestion of a keel, not Gothic arched as his figure suggests.

A comparison of the two species may be stated as follows:—

L. columnarius. Has the valves steeply Gothic arched, sculpture coarser; lateral areas distinctly elevated, showing no well-marked growth

lines; the pleural area shows 20 chains of pustules on each side of the jugum.

P. subantarcticus. The valve is distinctly rounded, with very little vestige of carination; the lateral areas are scarcely elevated, showing markedly 4 or 5 growth periods, and is shallower; 25 chains of very fine pustules on each side of the jugum.

The type is in the Australian Museum (ex Finlay collection).

Add to III. Family LEPIDOCHITONIDAE.

17a. ICOPLAX SUBEUDOXA *sp. nov.*

1929. *Callochiton klemi* Ashby, Trans. N.Z. Inst., lx., 375, pl. 32, fig. 12, August 29. Foveaux Strait, N.Z.

Again Ashby has described a N.Z. shell and associated it with an Australian species, so that again it becomes necessary to name the valve figured by Ashby, and fortunately deposited in the Dominion Museum, Wellington.

The differences between the Australian and Neozelanic shells are given by Ashby, and the Neozelanic shell is also quite distinct from *C. sulculatus* Suter. Ashby's description is as follows: "Median valve measures 6.5 x 3 mm., angle of divergence 90°, colour flesh-pink with lighter mottlings, surface smooth, except for growth-lines and minute decussate pattern; ornamented with seven almost circular pits, of which the two outer are imperfectly formed; the pits themselves are very much smaller and the ridges between are much larger, three times the width of those in *C. empleurus.*

"The structure of the pits is very distinct from that of *C. empleurus,* but whether this species is truly conspecific with the unique example from South Australia cannot be stated with certainty until further examples are forthcoming from South Australia, showing the end valves. The short circular character of the pits and the broad interspaces are common to both, but I note that the South Australian shell is more beaked, and the pits are not quite identical, so the receipt of more material may, after all, make separation possible."

IV. Family LORICIDAE.

This family, a very characteristic feature of the extra tropical Australian Loricate fauna, appears in the north of New Zealand, a somewhat unexpected occurrence.

The species are few in number, and three genera are recognised in Australian waters, but only one genus and species is so far recorded from the Neozelanic Region. It will be interesting to watch for its discovery in the Neozelanic fossil beds, as the family is well represented in the palaeontology of Australia.

The peculiar posterior valve with its unslit posteriorly sinuate insertion plate, and the scaly girdle more or less interspersed with spiculose tufts, make the members easily recognisable.

viii. Genus LORICA.

1852. *Lorica* H. and A. Adams, Ann. Mag. Nat. Hist., ser. 11, vol. ix., 355. Type by monotypy *Chiton cimolius* Reeve.

1853. *Aulacochiton* Shuttleworth, Mittheil. Naturf. Gesell. Berne, 68. Type by monotypy *Chiton volvox* Reeve.

1926. *Zelorica* Finlay, Trans. New Zeal. Inst., lvii., 334, December 23. Type by monotypy *Lorica haurakiensis* Mestayer.

Shells medium to large, more or less elevated, keeled, elongately ovate, girdle scaly with corneous tufts.

Colour generally dull, sometimes brightly streaked.

Sculpture consists of radial rows of distant pustules on end valves and lateral areas, and raised longitudinal lines of coalesced pustules, sometimes with cross threads, on the central areas.

Girdle notably slit posteriorly, covered with oval scales of different sizes, somewhat loosely packed with scattered spiculose tufts more or less distributed.

Insertion plates large, striated in anterior and median valves; the former eight-slit, the latter one-slit; sutural laminae large, sinus very small, with a projecting subdenticulate block present; posterior valve with an unslit callus somewhat sinuate.

Zelorica was provided by Finlay for the Neozelanic species, as the girdle examined showed no spiculose tufts. This conclusion requires confirmation from the study of juvenile specimens as the type species of *Lorica*, *cimolia*, generally has the tufts absent in the adult, but they can be found in very small specimens. The Sydney *Lorica volvox* has very numerous tufts at all stages, well preserved specimens showing three or four rows somewhat alternating.

26. Lorica haurakiensis.

(Plate xvi., fig. 1.)

1921. *Lorica haurakiensis* Mestayer, Trans. New Zeal. Inst., liii., 1920, 177, pl. 38, figs. 1-3, July 4, 1921. Hauraki Gulf, 20 fath., New Zealand.
1907. *Lorica volvox* Suter, Proc. Mal. Soc., iii., 297.
1913. *Lorica volvox* Suter, Man. N.Z. Moll., 46. Atlas, pl. 2, fig. 22, pl. 5, fig. 3 a-b.
1915. *Lorica volvox* Iredale, Trans. New Zeal. Inst., xlvii., 1914, 425.
1924. *Lorica haurakiensis* Finlay, Trans. New Zeal. Inst., lv., 517.
1926. *Lorica haurakiensis* Mestayer, Trans. New Zeal. Inst., lvi., 587, pl. 101, fig. 10.

Not

1872. *Chiton rudis* Hutton, Trans. New Zeal. Inst., iv., 1871, 179. Type in the Colonial Museum; locality not stated. = Sydney, New South Wales.

Many years ago Hutton described a shell, apparently from New Zealand, in the Colonial Museum, as *C. rudis*, and later this was recognised as a species of *Lorica*, determined as the Sydney species, and dropped from the Neozelanic List. Some forty years after Hutton's description Captain Bollons found a species of *Lorica* living in the Hauraki Gulf, and it was recorded as the Sydney species. A specimen was given to Hull by Captain Bollons, and sent to Iredale for comparison with the types in the British Museum. It was found to differ appreciably, but could not be described until comparison had been made with the type of Hutton's *rudis*. This was done by Miss Mestayer, who showed that Hutton's shell was a Sydney specimen, and therefore the Neozelanic species needed description, which was offered as follows:—

"Shell ovately oblong, steeply elevated, dorsal ridge acute, side slopes very slightly convex. Anterior valve erect, lightly curved forward, with fourteen irregularly spaced radial ribs, smooth for about two-thirds their length, but bearing near the girdle from four to six low, steeply rounded nodules; the interstices show faint concentric growth-lines; posterior angles of the apex finely vertically ribbed. Median valves. The first of these is considerably larger than the others, the jugal area sculptured with

oblique radial ribs, which form inverted 'V' up it; pleural areas finely horizontally ribbed. In valves 3 to 8 the horizontal ribbing is continued across the jugal tract. The number of ribs varies with the age of the shell; the holotype has nineteen horizontal ribs, the interstices rather wider and perfectly smooth. The lateral areas raised, somewhat variable, some having one or three more or less decided radial riblets, but they may be obsolete on one or more of these areas. A few low, steeply rounded nodules are rather irregularly scattered over the riblets. Posterior edges of valves denticulate, and showing traces of fine vertical striae at the apex. The concentric growth-lines are clearly visible. Posterior valve the smallest, horizontally ribbed, bounded by a strong slightly upstanding rib, bearing a few nodules. In some specimens there are traces of fine vertical riblets on the posterior angle. The mucro is terminal. The valve rather deeply grooved posteriorly. Girdle medium width, closely set with smooth convex scales, which vary slightly in size. There are no tufts of bristles; the posterior slit extends the whole length of the girdle. Colour reddish-brown with a fairly broad creamy-yellow bar along the centre of the shell. The girdle about the same colour, with darker transverse bars. Individual specimens appear to vary somewhat in colour. Interior reddish, sutural plates almost white, sinus very narrow, rather shallow. Anterior valve with about eight slits, median valves one-slit. Length 30 mm.; breadth 20 mm.

"Off Kawau Island, Hauraki Gulf, N.Z.; 20 fathoms."

V. Family Cryptoconchidae.

This family is based upon the anomalous Neozelanic species, *Cryptoconchus porosus* Burrow, which is also one of the largest species. The anterior valve is regularly five-slit, sometimes the slits becoming obsolete, but never the regular eight of other families such as the Plaxiphoridae and Mopaliidae. Ashby, in his original papers, included *Katherina* in this family, because this genus bears a very superficial resemblance, but the slitting was sufficient to determine its allies, and Thiele had confirmed the location by study of the radula which is typically Mopalioid. The radula in this family is also characteristic, and it is noteworthy that, although Ashby has recommended the usage of this feature, he discarded it in the instances when it was seen to be of great value. Another superficial feature which makes most members recognisable at sight is the non-differentiation of the pleural and lateral areas of the median valves; when these are separated by a rib this is nodulose and in agreement with the remainder of the sculpture, rarely obsolete, still more rarely linear. The girdle generally shows outstanding tufts around the anterior valve, sometimes behind the posterior valve, and at the sutural pores of the median valves; otherwise the girdle is more or less clothed with spicules, sometimes practically naked, at others densely spiculose with long spines. Thus, the development of the huge naked girdle with large tufts (retracted in death) of *Cryptoconchus* is merely an exaggeration of the broad leathery girdle of the other large New Zealand species, *N. violaceus* Q. & G., and the variation in the opposite direction is seen in the Australian *N. speciosus* H. Adams, where the girdle encroaches on the shell in the same manner, and to the same extent, but is thickly covered with long glassy spicules, giving it a very distinctive appearance. Internally the median valves have only one slit, which may become obsolete, but the insertion plates are grossly enlarged and form wing-like processes, leaving only a minute sinus. The posterior valve is likewise distinctive, in that there are two well-marked side slits, rarely obsolete, while sometimes the interspace between the two slits is multi-slit. Rarely

the whole insertion plate of the posterior valve degenerates to a mere callus, and upon the recognition of this sporadic feature in a fossil Ashby has built up a wonderful but flimsy edifice of the evolution of this group.

The difficulty of defining the generic groups in this family has been emphasised by Iredale, and in connection with Neozelanic shells it is even more pronounced than in Australian forms. Ashby has noted this also, and suggesting that there is only one genus has added more complications by treating the same species under different generic and subgeneric names.

On the littoral of New Zealand three distinct groups are easily separated, *Cryptoconchus*, *Acanthochiton* and *Notoplax*. The first-named can never be confused, and at present in Neozelanic waters only one species is allowed; the second was only regarded as monotypic until quite recently, but now the number of species is indefinite and in some cases dredged shells may even be confused with the lastnamed *Notoplax*. *Notoplax* is founded upon a Tasmanian dredged shell of large size, very small exposed tegmentum, huge girdle thickly spiculose. The common large Neozelanic shell has a wide naked girdle, looks very distinct and has been named *Loboplax*. A closely allied species of "*Loboplax*" has the girdle finely spiculose and dredged shells are quite intermediate. When specimens are secured by means of the dredge still more difficulties appear as, although the earliest known was separable at sight, recent accessions have proved difficult to locate generically. Iredale recommended *Craspedochiton*, and this will be here used, as although we at first thought emendation could be made we will show that extreme variability has made differentiation impossible. Ashby has, however, provided two generic names for the Neozelanic species in case a differentiation should be substantiated.

viii. Genus Cryptoconchus.

1815. *Cryptoconchus* Burrow, Elements of Conch., 1st ed., 190, 1815. ex Blainville MS.

Type by subsequent designation Gray, 1847, *Chiton porosus* Burrow.

This name was introduced as follows in connection with the new species *C. porosus* and *C. larvaeformis*: "They have been examined by Dr. Blainville, of Paris, by whom a communication respecting them, has, it is understood, been made to the French Philomatic Society. The names he has affixed to the two species are *Cryptoconchus porosus* and *C. larvaeformis*." From subsequent literature we can deduce that Blainville intended the genus name to cover the group we now know as *Cryptoplax*, as this name he published later in connection with the same two species. Gray fixed the type of *Cryptoconchus* on the Neozelanic species, and it has been so utilised ever since.

While at first sight this genus appears very peculiar, it really is a very obvious development as seen by the other members of the family. Restricted to New Zealand, the type remained the sole member of the typical *Cryptoconchus* until quite recently, when Nierstrasz (Siboga Exped., 1905, 68) named a second species from the Moluccas, a strange case if the association be confirmed.

Shell large, tegmentum very small, articulamentum very large and strong. Sculpture very restricted but pustulose, dorsal area marked, no differentiation between lateral and pleural areas; insertion plates abnormally large; sinus shallow; anterior valve with normal five-slitting, median valves one-slit on each side; posterior valve five to seven slit; girdle very large, fleshy, sutural tufts present. Gills posterior, and radula characteristic.

As noted above, although *Katharina* has a somewhat similar super-

ficies, it is merely due to convergence, the eight-slit anterior valve indicating at once its true relationship, the long gills confirming this, and the radular features absolutely determining its non-relationship to this group, and its true place in the MOPALIIDAE.

26. CRYPTOCONCHUS POROSUS.

(Plate xvi., fig. 8.)

1815. *Chiton porosus* Burrow, Elements Conch., 189, pl. xxviii., fig. 1. "Hab. uncertain, probably New South Wales" = New Zealand. Type in British Museum.
1818. *Cryptoplax depressus* Blainville, Dict. Sci. Nat. (Levrault), xii., 124. Same specimen.
1825. *Chiton leachi* Blainville, Dict. Sci. Nat. (Levrault), xxxvi., 554. Same specimen.
1825. *Chiton porosus* Burrow, Elements Conch., 2nd ed., 178, pl. xxviii., fig. 1.
1829. *Cryptoconchus porosus* Guilding, Zool. Journ., v., 28.
1835. *Chiton monticularis* Quoy and Gaimard, Voy. de l'Astrol. Zool., iii., 406, pl. 73, figs. 30-36. L'anse de l'Astrolabe. N.Z. Type in Paris Museum.
1836. *Chiton monticularis* Deshayes, Hist. Anim. s. Vert. (Lam.), 2nd ed., vii., 519.
1840. *Cryptoconchus porosus* Swainson, Treat. Malac., 358.
1840. *Chiton monticularis* Sowerby, Conch. Illus., fig. 129.
1843. *Amicula monticularis* Gray, Travels in New Zeal. (Dieffenbach), ii., 246.
1847. *Chiton monticularis* Reeve, Conch. Icon., ii., pl. 10, fig. 57.
1848. *Chiton* (*Symmetrogephyrus*) *monticularis* Middendorff, Mem. Sci Nat. Imp. Sci. St. Petersb., vi., 1847, 98. February, 1848.
1854. *Cryptoconchus porosus* H. & A. Adams, Gen. Rec. Moll., i., 482, pl. 55, fig. 4.
1857. *Cryptoconchus porosus* Gray, Guide Distr. Moll. B.M.
1859. *Cryptoconchus porosus* Chenu, Man. de Conch., 383, fig. 2884.
1872. *Cryptoconchus monticularis* Hutton, Trans. New Zeal. Inst., iv., 1871, 183.
1873. *Cryptoconchus monticularis* Hutton, Cat. Man. Moll. N.Z., 51.
1880. *Cryptoconchus porosus* Hutton, Man. N.Z. Moll., 118.
1882. *Cryptoconchus stewartianus* Rochebrune, Bull. Soc. Philom., Paris (7), vi., 194. Stewarts Island, N.Z. Type in Paris Museum.
1883. *Cryptoconchus porosus* Hutton, Trans. N.Z. Inst., xv., 1882, 129, pl. xvi., fig. H. (dentition).
1893. *Acanthochites porosus* Pilsbry, Man. Conch., xv., 36, pl. iii., figs. 57-62.
1897. *Acanthochites* (*Cryptoconchus*) *porosus* Suter, Proc. Mal. Soc., ii., 193.
1904. *Acanthochites porosus* Hutton, Index Faunae, N.Z., 86.
1904. *Cryptoconchus* (*Acanthochites*) *porosus* Wissel, Zool. Jahrb. Abh. Syst., xx., 618.
1905. *Acanthochites porosus* Hamilton, Col. Mus. Bull. No. 1, 36.
1909. *Acanthochites porosus* Suter, Nachr. Blatt. d. Mal. Gesell., 74.
1913. *Acanthochites porosus* Suter, Man. N.Z. Moll., 27. Atlas, pl. 2, fig. 10, pl. 4, fig. 2.
1915. *Cryptoconchus porosus* Iredale, Trans. N.Z. Inst., xlvii., 1914, 425.
1920. *Cryptoconchus porosus* Mestayer, N.Z. Journ. Sci. Tech., iii., 117 (carnivorous).
1922. *Cryptoconchus* (*A.*) *monticularis* Ashby, Trans. Roy. Soc. South Austr., xlvi., 579. (Type examined ?).

1922. *Cryptoconchus stewartianus* Ashby, *id., ib.*
1924. *Cryptoconchus porosus* Odhner, Vidensk. Medd. Dansk. Nat. Foren. Bd., 77 (N.Z. Moll.), 8.
1926. *Cryptoconchus porosus* Ashby, Proc. Mal. Soc., xvii., 27, pl. iii., figs. 2 a-c, April 30. (Co-type of *stewartianus* described).

Burrow's description was brief but somewhat quaint, thus: "Shell 8-valved, carinate, valves with a tooth on each side, covered entirely with the marginal membrane. Specimen pale olive above, sides brown, coriaceous covering cinereous or pale brown, tomentous; perforated over the back of each valve with a small slit and two tubular pores; valves finely striate and irregularly granulate; posterior valve indented in the margin; lateral triangles marked by an obsolete fold, and terminated by a small, sharp, tooth-like process.

Habitat uncertain, but probably New South Wales.

The animal possessing this very curious multi-valve shell differs from the inhabitant of *Chiton* in the arrangement of the lungs, which do not extend so far on either side, but only about one-third of the length; and in the intestinal canal."

When Quoy and Gaimard met with the species in New Zealand they described it as a new species in detail and gave excellent figures.

Rochebrune later named a shell from Foveaux Strait, but the differences noted at present appear to be individual, but the geographic range is abnormal. There appears to be no record of this striking and somewhat obtrusive form from the Chatham Islands or the Subantarctic Islands, an item which may later prove of value.

The form may be shortly described: Shell large, almost covered by the girdle, which is very large and fleshy, the uncovered tegmentum being practically linear and showing mostly the very narrow dorsal area only of the median valves, a minute subcircular spot on the anterior valve and a long line on the posterior valve; the sculpture adjacent consists of a few small flattened subcircular pustules. Colour pale brown. The huge tegmentum is very strong and the anterior valve is five-slit, the median valves one-slit on each side, the posterior valve is many-slit between the regular two side slits, slits varying from five to seven.

Girdle in life bright orange to reddish brown, furnished with eighteen sutural tufts of spicules, appearing to rise out of elevated pockets.

Length of dead specimens over 50-60 mm., but considerably more in life; breadth 25 mm., similarly capable of extension when living.

Habitat: Throughout New Zealand.

ix. Genus Acanthochiton.

1821. *Acanthochiton* Gray, London Medical Repository, xv., 234. Type by monotypy *Chiton fascicularis* Linn.
1826. *Acanthochites* Risso, Hist. Nat. l'Eur. Merid. iv., 268. Type by virtual tautonymy *A. communis* = *Chiton fascicularis* Linn.
1830. *Phakellopleura* Guilding, Zool. Journ., v., 28. Type by monotypy *Chiton fascicularis* Linn.
1847. *Kapellopleura* Reeve, Conch. Icon., iv., introd. text to Plate i. Error for *Phakellopleura* Guilding only.
1848. *Hamachiton* Middendorff, Mem. Sci. Nat. Imp. Sci. St. Petersb., vi., 1848, 83, 98. Type by subsequent designation (Ire. & Hull, Austr. Zool., iv., 1925, 76) *Chiton fascicularis* Linn.
1848. *Platysemus* Middendorff, Mem. Sci. Nat. Imp. Sci. St. Ptersb., vi., 1848, 83, 98. Type by subsequent designation (Ire. & Hull, Austr. Zool., iv., 1925, 76) *Chiton fascicularis* Linn.

1882. *Stectoplax* Dall, Proc. U.S. Nat. Mus., iv., 284, 288. Type by monotypy *Stectoplax porrecta* Cpr. (Japan).
1885. *Anisochiton* Fischer, Manuel de Conch., 881. Type by subsequent designation (Ire. & Hull, Austr. Zool., iv., 1925, 76) *Chiton fascicularis* Linn.

Shells small, elongate oval; sculpture of small pustules, dorsal area smooth or longitudinally striate; lateral and pleural areas scarcely differentiated; no radial ribbing on end valves; insertion plates and sutural laminae very large, continuous; anterior valve five-slit, rarely three, slits sometimes obsolete (this feature has not yet been observed in Neozelanic specimens); median valves one-slit on each side, slits sometimes missing (not in Neozelanic shells); posterior valve with two slits, sometimes obscurely inter-slit; girdle leathery, more or less covered with spicules of various degrees of thickness and length, but larger and prominent bunches at the sutures.

The Neozelanic species are not well differentiated at present, and we are tentatively allowing three species, although it may be that there are more, but until long series are collected from various localities, and different ecological conditions are studied, little good will accrue by haphazard description of shells as recently performed by Ashby.

An attempt to make a guide to the forms named results as follows:—

Dorsal area smooth .. .. *A. zelandicus.*
Dorsal area longitudinally grooved.
Posterior valve small .. .. *A. thileniusi.*
Posterior valve large .. .. *A. brookesi.*

This looks so simple that no confusion would appear possible, but when examples of *"zelandicus"* from various localities are compared many small differences can be observed, and their value depends on constancy in series.

27. Acanthochiton zelandicus.

27a. Acanthochiton zelandicus zelandicus.

(Plate xvi., fig. 9.)

1835. *Chiton zelandicus* Quoy and Gaimard, Voy. de l'Astrol., iii., 400, pl. 73, figs. 5-8. French Pass, New Zealand (South Island).
1836. *Chiton zelandicus* Deshayes, Hist. Anim. s. Vert. (Lam.), 2nd ed., vii., 518.
1843. *Chitonellus zelandicus* Gray, Travels in N.Z. (Dieffenbach), ii., 246.
1847. *Chiton zelandicus* Reeve, Conch. Icon., iv., pl. xi., sp. and fig. 58.
1873. *Chitonellus zealandicus* Hutton, Cat. Marine Moll., 57.
1880. *Acanthochites zealandicus* Hutton, Man. N.Z. Moll., 117.
1883. *Acanthochites zealandicus* Hutton, Trans. N.Z. Inst., xv., 1882, 129, pl. xvi., fig. G. (dentition).
1893. *Acanthochites zelandicus* Pilsbry, Man. Conch., xv., 16, pl. 14, figs. 9-10.
1897. *Acanthochites zelandicus* Suter, Proc. Mal. Soc., ii., 192.
1904. *Acanthochites zelandicus* Hutton, Index Faunae N.Z., 86.
1904. *Acanthochites spiculosus astriger* Wissel, Zool. Jahrb. Abt. Syst., 20, 612. Error only.
1904. *Acanthochites bisulcatus id., ib.*, p. 614.
1905. *Acanthochites zelandicus* Hamilton, Col. Mus., Bull. No. 1, 36.
1909. *Acanthochites bisulcatus* Suter, Nach. Blätt. Malak. Gesell., 2, 74. Correction of Wissel's error.
1913. *Acanthochites zelandicus* Suter, Man. N.Z. Moll., 26. Atlas: pl. 2, fig. 9, pl. 4, fig. 1.
1915. *Acanthochiton zelandicus* Iredale, Trans. N.Z. Inst., xlvii., 1914, 425.

1922. *Acanthochiton zelandicus* Ashby, Trans. Roy. Soc. South Australia, xlvi., 579 (type examined?).
1924. *Acanthochiton zelandicus* Odhner, Vidensk. Medd. Dansk. Nat. Foren. Bd., 77 (N.Z. Moll.) 6. (Stewart Island).
1926. *Acanthochiton zealandicus* Ashby, Proc. Mal. Soc., xvii., ii., pl. i., figs. 1 a-c., pl. ii., fig. 5.

Shell small, elongate oval, little elevated, round backed, girdle leathery, with bunches of dense spicules at sutures.

Coloration varied, greenish of various shades, mottled and blotched with whitish; sometimes the dorsal area darker, bordered with white stripes.

Sculpture of round pustules with flattened slightly concave tops, closely packed but not touching; no demarcation at all between pleural and lateral areas; dorsal area triangular, smooth with transverse growth lines, but showing subcutaneous lining. Anterior valve with well rounded margin and showing no signs of radial waving; median valves deep in proportion to breadth; posterior valve with mucro elevated, submedian; posterior slope fairly straight.

Interior coloration pale bluish to greenish. Slitting 5—1—2.

Girdle leathery, covered with fine spicules and with bunches of long slender spicules at sutures; the coloration of these bunches varies from whitish to green and even red.

Dimensions: 19 x 9 mm. Dried figured specimen, but much larger specimens occur, especially when alive.

Habitat: New Zealand, south of North Island and north of South Island, perhaps more extensive.

Station: Between tide marks, under stones in rock pools, or on mud flats.

Remarks: The type locality is French Pass, in the north of South Island, and the figure shows that this is a smooth backed form. Iredale examined the presumed type some years ago, and noted it agreed with the general interpretation of the specimen.

27b. Acanthochiton zelandicus hookeri.

(Plate xvi., fig. 10.)

1843. *Acanthochoetes hookeri* Gray, Travels in New Zeal. (Dieffenbach) ii., 262. Inhab. New Zealand, Great Barrier Island, Bay of Islands.
1872. *Acanthochaetes hookeri* Hutton, Trans. N.Z. Inst., iv., 1871, 182.
1873. *Acanthochaetes hookeri* Hutton, Cat. Marine Moll. N.Z., 50.
1926. *Acanthochiton zealandicus doubtlessensis* Ashby, Proc. Mal. Soc., xvii., 12, pl. i., figs. 2 a-c., pl. ii., fig. 6, April 30. Doubtless Bay, North Island, New Zealand.

Ashby overlooked the description given by Gray, which reads: "Valves half ovate, covered with crowded flat-topped granules, grey and green striped; the central ridge olive, smoother. The interior (*sic*) valve evenly granulated, without any ridges. The mantales (*sic*) hirsute, the tufts of spines large and green. This species is most like *Acanthochoetes fasciculatus* of the English coast; it differs from *A. violaceus* in the size of the tuft, and the front valve not being rayed."

Ashby described his subspecies thus: "This form differs from *zealandicus* (*sic*) s.s., in the whole shell being much less raised; in the form of the median valves which are very flat and longitudinally short; in the sculpture, the granules being more elongate, definitely larger and more widely spaced; in the tail valve having the posterior slope, behind mucro, less vertical. *Measurements of Valves.*—Anterior valve, lat. 3.5 mm., long.

2.5 mm.; median valve, lat. 4.25 mm., long., 2.75 mm.; tail valve, lat. 3.5 mm.; long., 1.5 mm." Then followed measurements of paratypes with dimensions transposed!

Comparison of series from Auckland Harbour, Tauranga Island, indicates that the northern race of *zelandicus* has a tendency to elongation of the pustules, perhaps a little more depressed and the valves of less depth. The greatest value that can be given this form is subspecific.

27c. Acanthochiton zelandicus amplificatus *subsp. nov.*

(Plate xvi., fig. 11.)

Many shells from the south of New Zealand and Stewart Island are very much larger, with distinct long teardrop pustules fairly crowded, and extreme specimens could easily be considered a distinct species. As many, however, show the pustules to be subcircular in youth, we here regard this southern shell as a subspecies only. The type specimen is a fine shell, collected by W. R. B. Oliver at Half Moon Bay, Stewart Island, under stones between tide marks. It is of the usual greenish colour with the dorsal area darker, the girdle very broad, the spicules well developed, the sutural tufts large and greenish, the spicules of delicate proportions. The lateral areas are indicated by slight waves.

Dimensions of dried specimen: 31 x 20 mm. Type in Dominion Museum.

28. Acanthochiton brookesi.

1926. *Acanthochiton brookesi* Ashby, Proc. Mal. Soc., xvii., 14, pl. i., fig. 3 a-c., pl. ii., fig. 7. Locality unknown, probably Auckland Harbour.

We have not seen this species, but from Ashby's description here reproduced it appears to differ in the formation of the posterior valve, while the dorsal area is longitudinally deeply grooved. Although the locality was doubtful, Ashby hazards the suggestion that this species alone occurs in Auckland Harbour, an item we can at once deny, as we have numerous examples from this locality which do not agree with Ashby's description, which is as follows:—

"General Appearance: Dry and damaged specimen, elongate ovate, the tegmentum gradually increasing in width from the anterior valve to the sixth valve inclusive, the last two valves rapidly tapering; colour greyish-brown, mottled with dirty white; dorsal area raised, narrow, and strongly longitudinally grooved; sculpture consisting of small, flat, circular, closely packed granules.

"Anterior Valve: Anterior slope convex, apex slightly protruding, ray-folds not perceptible; sculpture similar to the latero-pleural areas of the median valves; insertion plate sloping forward, teeth sharp, but owing to damage not all slits present, no doubt five.

"Median Valve: Valve No. 4, dorsal area raised and arched, longitudinally convex, narrow, beaked; longitudinally deeply grooved. The latero-pleural areas are inseparable, side slope almost straight, decorated very evenly with more or less longitudinal rows of small, circular, flat granules, commencing very small near the dorsal area, and increasing in size anteriorly and laterally; sutural laminae well produced, but damaged; sinus between broad, slits 1—1; articulamentum pale greenish.

"Tail Valve: This valve is a good deal raised, dorsal area broader in proportion to the dorsal areas of the median valves, but similarly grooved; mucro postmedian, well defined; posterior slope at first very steep, then becoming more gradual; sculpture similar to the latero-pleural areas of the median valves. The sutural laminae are well produced and square-edged anteriorly, the sinus between broad; tegmentum of dorsal area overlapping,